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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/687,303	10/14/2003	Eko N. Onggosanusi	TI-35477	7910

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EXAMINER	
ZHENG, EVA Y	
ART UNIT	PAPER NUMBER
2611	

DATE MAILED: 12/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/687,303	ONGGOSANUSI ET AL.	
	Examiner	Art Unit	
	Eva Yi Zheng	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-38* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,9-11,15,16,19-20,24-38* is/are rejected.

7)☒ Claim(s) *5-8,12-14,17,18 and 21-23* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 2, 4, 24, 25, and 27 are rejected under 35 U.S.C. 102(e) as being unpatentable by Das et al. (US 2003/0148770).

a) Regarding to claim 1, Das et al. disclose a method for interference-resistance using closed-loop transmit diversity (CLTD) at a receiver comprising:

receiving a signal (122 in Fig. 1 and 204 in Fig. 2);

computing a CLTD weighting vector from the received signal (128 in Fig. 1 and 208 in Fig. 2);

providing the CLTD weighting vector to a transmitter (129 in Fig. 1 and 210 in Fig. 2); and

using the CLTD weighting vector to suppress interference (119 in Fig. 1 and 212 in Fig.2).

b) Regarding to claim 24, Das et al. disclose a method for interference-resistance using closed-loop transmit diversity (CLTD) comprising:

at a receiver (120 in Fig. 1)

receiving a signal (122 in Fig. 1 and 204 in Fig. 2);

computing a CLTD weighting vector from the received signal (128 in Fig. 1 and 208 in Fig. 2);

providing the CLTD weighting vector to a transmitter (129 in Fig. 1 and 210 in Fig. 2);

using the CLTD weighting vector to suppress interference (119 in Fig. 1 and 212 in Fig.2);

the method further comprising at a transmitter (110 in Fig. 1)

transmitting a signal (112 in Fig. 1);

receiving the CLTD weighting vector (119 in Fig. 1 and 304 in Fig. 3); and

applying the CLTD weighting vector to subsequent transmissions (116, 118 in Fig. 1 and 306,308,310 and 312 in Fig. 3).

c) Regarding to claims 2 and 25, Das et al. disclose wherein the using produces an estimate of the signal transmitted by the transmitter (as shown in Fig. 1).

d) Regarding to claims 4 and 27, Das et al. disclose wherein there are multiple users, and wherein the using comprises using the CLTD weighting vector, a channel estimate, and spreading codes for each user (as shown in Fig. 1).

3. Claims 1-4, 9-11, 15, 16, 19, 20 and 24-29 are rejected under 35 U.S.C. 102(e) as being unpatentable by Horng et al. (US 2004/0032910).

a) Regarding to claim 1, Horng et al. disclose a method for interference-resistance using closed-loop transmit diversity (CLTD) at a receiver comprising: (STTD is closed

loop transmit diversity since there's a feedback signal from the receiver to the transmitter as shown in Fig. 2)

receiving a signal (301 in Fig. 3);

computing a CLTD weighting vector from the received signal (330 in Fig. 3);

providing the CLTD weighting vector to a transmitter (261 in Fig. 3); and

using the CLTD weighting vector to suppress interference (260 in Fig. 2).

b) Regarding to claim 24, Horng et al. disclose a method for interference-resistance using closed-loop transmit diversity (CLTD) comprising: (STTD is closed loop transmit diversity since there's a feedback signal from the receiver to the transmitter as shown in Fig. 2)

at a receiver (Fig. 3)

receiving a signal (301 in Fig. 3);

computing a CLTD weighting vector from the received signal (330);

providing the CLTD weighting vector to a transmitter (261);

using the CLTD weighting vector to suppress interference (260 in Fig. 2);

the method further comprising at a transmitter (110 in Fig. 1)

transmitting a signal (Fig. 2);

receiving the CLTD weighting vector (300 in Fig. 2); and

applying the CLTD weighting vector to subsequent transmissions (260 in Fig. 2).

c) Regarding to claims 2 and 25, Horng et al. disclose wherein the using produces an estimate of the signal transmitted by the transmitter (320 in Fig. 3).

d) Regarding to claim 3 and 26, Horng et al. disclose wherein the computing of the CLTD weighting factor comprises:

calculating a channel estimate from the received signal (320 in Fig. 3); and

computing the CLTD weighting vector based on the channel estimate (330 in Fig. 3).

e) Regarding to claims 4 and 27, Horng et al. disclose wherein there are multiple users, and wherein the using comprises using the CLTD weighting vector, a channel estimate, and spreading codes for each user (330,320, and 310 in Fig. 3).

4. Claims 30-38 are rejected under 35 U.S.C. 102(e) as being unpatentable by Paulraj et al. (US 2002/0027957).

a) Regarding to claim 30, Paulraj et al disclose a receiver comprising:

a channel estimation unit coupled to a signal input, the channel estimation unit containing circuitry to calculate an estimate of a communications channel (88 and 94 in Fig. 9; [0087-0090]);

a weighting vector unit coupled to the channel estimation unit, the weighting vector unit containing circuitry to compute a weighting vector from the estimate of the communications channel (112 in Fig. 10B; [0091]);

a feedback unit coupled to the weighting vector unit, the feedback unit to provide the estimate of the communications channel back to a source of a received signal provided by the signal input (feedback to transmitter in Fig. 9); and

an interference resistant detection unit coupled to the signal input, the interference resistant detection unit containing circuitry to use the estimate of the communications channel and the weighting vector to improve interference resistance of the receiver (86 in Fig. 9; Fig. 10B; [0091]).

b) Regarding to claim 35, Paulraj et al disclose a communications system comprising:

a transmitter coupled to a data source, the transmitter containing circuitry to encode and spread a data stream provided by the data source and to transmit the encoded and spread data stream (inherent in 60 in Fig. 7);

a communications channel coupled to the transmitter, the communications channel to carry the transmitted encoded and spread data stream (transmitter 74A-X in Fig. 8);

a receiver coupled to the communications channel (82 in Fig. 9), the receiver comprising

a channel estimation unit coupled to a signal input, the channel estimation unit containing circuitry to calculate an estimate of a communications channel (88 and 94 in Fig. 9; [0087-0090]);

a weighting vector unit coupled to the channel estimation unit, the weighting vector unit containing circuitry to compute a weighting vector from the estimate of the communications channel (112 in Fig. 10B; [0091]);

a feedback unit coupled to the weighting vector unit, the feedback unit to provide the estimate of the communications channel back to a source of a received signal provided by the signal input (feedback to transmitter in Fig. 9); and

an interference resistant detection unit coupled to the signal input, the interference resistant detection unit containing-circuitry to use the estimate of the communications channel and the weighting vector to improve interference resistance of the receiver (86 in Fig. 9; Fig. 10B; [0091]).

c) Regarding to claim 31, Paulraj et al disclose wherein the interference resistance detection unit further uses known spreading codes of the received signal to improve the interference resistance of the receiver (inherent in CDMA system).

d) Regarding to claim 32, Paulraj et al disclose wherein the receiver receives signals from a plurality of users, and wherein the known spreading codes can be used to separate signals from each of the plurality of users from the received signal (Fig. 7, 8, 9 and 10B).

e) Regarding to claim 33, Paulraj et al disclose wherein the interference resistant detection unit first equalizes the received signal (114 in Fig. 10B) and then despreads the equalized received signal (inhere in CDMA system).

f) Regarding to claim 34, Paulraj et al disclose wherein the interference resistant detection unit first equalize the received signal (114 in Fig. 10B), then despreads the equalized received signal, and then coherently combines the despread received signal (inherent in CDMA system).

g) Regarding to claim 36, Paulraj et al disclose, wherein the communications channel is a wireless communications channel (as shown in Fig. 7).

h) Regarding to claim 37, Paulraj et al disclose, wherein the communications system is a code-division multiple access (CDMA) communications system (abstract).

i) Regarding to claim 38, Paulraj et al disclose, wherein the transmitter transmits the encoded and spread data stream over multiple antennas (inherent in CDMA system).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 9-11, 15, 16, 19, 20, 28, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horng et al. (US 2004/0032910) in view of Liang et al. (US 2003/0165131).

a) Regarding to claims 9-11, 15, 16, 19, 20, 28, and 29, Horng et al. teach a CDMA system with all the subject matters above except for the specific teaching of the receiver comprise equalizer, despreader and a combiner.

However, Liang et al, disclose a CDMA system, wherein the receiver comprise equalizing the received signal (412 in Fig. 7); dispreading the equalized received signal

(418 in Fig. 7); and coherent combining the despread equalized received signal (420 in Fig. 7).

Both Horng et al and Liang et al are direct to CDMA system. Therefore, it is obvious to one of ordinary skill in art to combine the teaching of equalizer, despreader and a combiner of Liang et al. in the receiver of Horng et al. So that the equalizer will apply the CLTD weighting vector and a channel estimate to the received signal. By doing so, effective recover the transmitted signal and suppressing interference in a CDMA system.

Allowable Subject Matter

7. Claims 5-8, 12-14, 17, 18 and 21-23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eva Y Zheng whose telephone number is 571-272-3049. The examiner can normally be reached on M-F, 7:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on 571-272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Eva Yi Zheng
Examiner
Art Unit 2611

December 5, 2006

CHIEH M. FAN
SUPERVISORY PATENT EXAMINER